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# Committee on Science, Space and Technology

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## House of Representatives

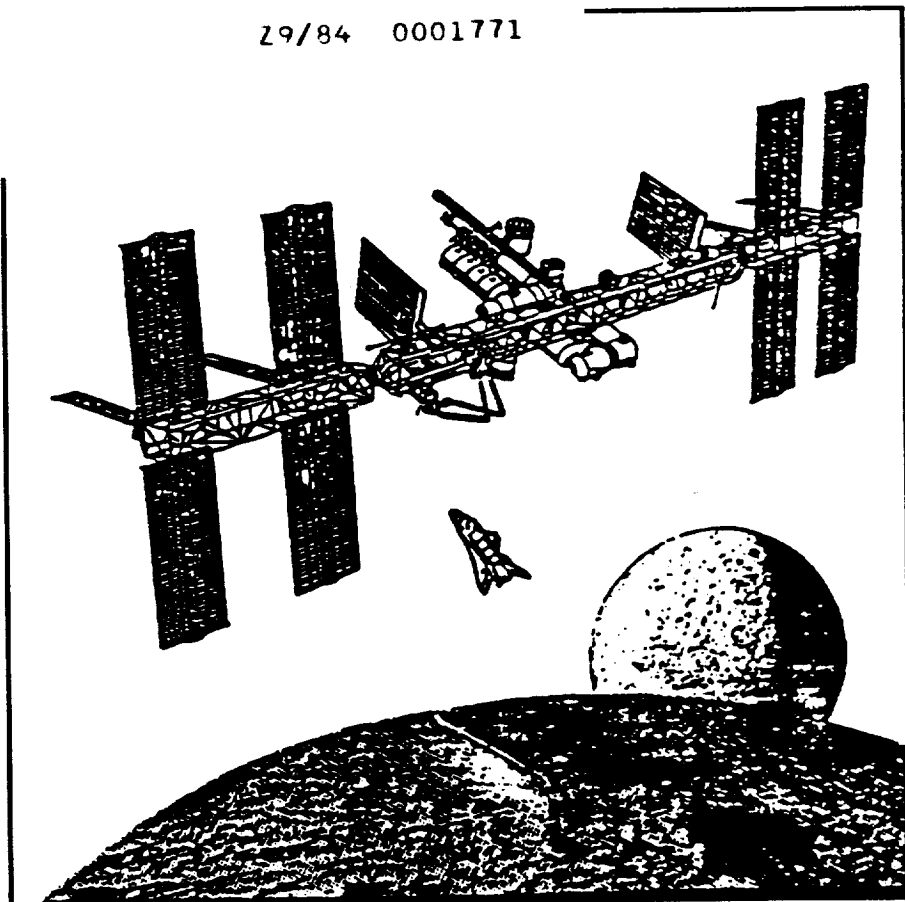
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Statement by:  
Richard H. Truly  
Administrator





Statement of  
Richard H. Truly  
Administrator  
National Aeronautics and Space Administration  
before the  
Committee on Science, Space, and Technology  
U.S. House of Representatives

Mr. Chairman and Members of the Committee,

NASA is here today to discuss recent progress and plans for the future of the Space Station Freedom program. We appreciate the staunch support that this Committee has given to the program, and we hope to retain that strong backing for the future.

This statement is organized into three sections regarding our recent activities. First, we discuss the factors motivating our recent efforts. Second, we describe the configuration and budget review process that we have used. Finally, we outline potential program changes under consideration.

The review of the Space Station Freedom program has been an extensive, careful process which continues. We realize that as the review has progressed, conflicting information about the nature of the potential changes has been made public, leading to the impression that some options under consideration had been accepted as final before their impacts were fully assessed. In fact, although we are near a decision on some options, we have not yet implemented any of the results of the review. NASA realizes that the Committee is concerned about some aspects of these potential decisions; we hope to allay these concerns at this hearing today.

Factors Behind the Review Activities

The recent review activities have included assessments of the program's configuration, management, budget and schedule. These activities were motivated by several factors which arose this summer. The review has not been



just a budget exercise, but a serious assessment of where we are, where we are going, and how we intend to get there.

The first factor concerns the changes in program management that occurred in the late spring. The top three Space Station managers left the program in May and June. While Acting Administrator, I decided to tap some of the Shuttle program's operational and management expertise by filling these positions with managers having extensive Shuttle program experience.

This new team, including Dr. William Lenoir as Associate Administrator, Richard Kohrs as Program Director, and, most recently, Robert Moorehead as Deputy Director, came on board with a need to understand thoroughly the program's requirements and commitments. In particular, they believed, and I believed too, that it was necessary to understand better where the risks in the program were located. Dr. Lenoir and Mr. Kohrs were not comfortable accepting the same level of program risk as had existed prior to their arrival, and wanted to see where it could be reduced. This summer's review activities enabled them to identify options for reducing technical, schedule and cost risk in the program.

The second factor involves the timing of the management change. The new management team joined the program just as it was beginning the transition from concept development and preliminary definition into preliminary system design. This transition, a normal part of any spacecraft development program, requires changes in organization and management practice. The program reorganization being planned will ensure that we have the right management structure at all levels of the program to move the preliminary design forward rapidly. The reorganization will include the appointment of new senior managers, the restructuring of the Headquarters and Reston offices, and the redistribution of responsibilities between the project offices and the Reston program office. Consistent with funding constraints and priorities, planned program office growth will be reduced.

The third factor relates to the consistent indications from the Congress that while Space Station Freedom's funding would increase in fiscal year 1990, we would not receive our full request. In April, the House Subcommittee on the VA, HUD and Independent Agencies requested that NASA provide an assessment of the impact of a twenty percent budget reduction in fiscal years 1990 and 1991. In May, NASA provided Chairman Traxler with a general estimate of the impacts, with the informal understanding that a more detailed response would be forthcoming. In July our concerns about the fiscal year 1990 appropriation were



heightened by the House appropriation recommendation of \$1.655 billion for the program, a twenty per cent reduction from the \$2.05 billion requested.

The fourth factor spurring our activities was the program's history, which has certainly contributed to its apparent, and to some extent, real uncertainty and instability. In the last five years, Space Station Freedom has undergone 11 major reviews, has faced nearly continual readjustments of its budget, has had a great deal of management turnover, and has experienced several configuration and schedule changes. One of the most important motivations of this summer's review activities was to stabilize the program to the degree possible and to carry it forward into the design phase. The results of this summer's review are aimed at achieving this goal. The first step was to stabilize the early part of the assembly schedule by maintaining the development activities leading to First Element Launch in fiscal year 1995. The second objective was to meet the commitments to our international partners and users. An assessment was necessary to identify how we could phase some content and capabilities to meet these commitments, hold First Element Launch, and at the same time, fit the program within its allotted funding. Proposed adjustments to content and rephrasing of activities have focused, to the maximum extent possible, on supporting our user requirements, and commitments to our partners.

I decided that a potential reduction of the magnitude the House Appropriations Committee indicated was forthcoming required a fundamental assessment of the program baseline in order to provide Congress with a substantive, detailed description of the effects of the proposed funding reduction prior to a final appropriation. We believed that understanding these effects in depth would speed any required program adjustment, minimizing any resulting instability. The summer's review included guidelines which assumed a worst case reduction of twenty per cent in fiscal years 1990 and 1991, and a budget runout consistent with such a reduction. Although we recognized, and very much appreciated the full authorization granted to the program, we still had to contemplate making adjustments to accommodate a reduced Space Station appropriation.

#### The Configuration/Budget Review Process

The convergence of these factors resulted in a decision to perform a careful, substantive assessment of all aspects of the program. The overriding objective of the review has been to plan Space Station Freedom program adjustments that



would minimize the necessary delay of assembly milestones and user capabilities, while accommodating a potentially significant budget reduction. In the review process, national objectives in space, program budgetary constraints, technical factors, views of the user community, commitments to our international partners, and Congressional direction have all been taken into account.

The Space Station review was a carefully planned process. It began with an initial three week study of potential systems options to focus our program analysis. We assembled a team to develop these options, instructing it to look at all possible changes which could reduce risk and development costs in the program. At all steps we have assessed the impact on life cycle costs of proposed changes and rephasings. The options were then extensively assessed within the normal program management structure with the users and our international partners participating.

The initial three week study was carried out by the Configuration/Budget Review Team. The team included senior managers from Headquarters and the Program Office, the Work Package Project Managers, and senior officials from the Office of Space Science and Applications, the Shuttle Office, the Astronaut Office, the NASA Comptroller's Office, and several NASA Centers. These individuals brought to the team a broad base of expertise and experience.

To focus its efforts, the Review team was given a number of guidelines. First, because we believed it important to maintain current program progress, the team was instructed to protect early program milestones, particularly the activities leading to First Element Launch. Second, the team was asked to assume a target Fiscal Year 1990 budget of \$1.65 billion, with corresponding budget runout for future years. The target budget profile was selected because of specific threats to FY 1990 and 1991, the need to maintain reasonable rates of buildup, and general threats to outyear availability. Third, the team was directed to support user community requirements, allow for eventual growth back to full capability, and to maintain our international agreements. Finally, the team was directed to identify potential options for simplifying the design and assembly process.

The Configuration/Budget Team concluded its study the last week in July. Program review of the options developed by the team began immediately thereafter, and included our international partners and user representatives. Iterations of trade studies of the station's systems have been performed, and more remain to be accomplished. Many of the



review team's options have already been eliminated as too costly to station capabilities. It was clear within six weeks after the Configuration/Budget Review Team concluded its activities that the exercise had failed to develop a set of options which would result in a stable and sustaining program capable of achieving its goals despite a twenty per cent funding reduction in FY 1990 and 1991. The content and capability adjustments necessary to accommodate this reduction were too severe to be acceptable.

Our current assessment is that the key elements of user capabilities can be supported if the requested FY 1990 budget is reduced by no more than \$200-250M. Many capabilities would become available at later dates than they would in the baseline, but virtually all are planned to be in place by Assembly Complete. The completed station of the late 1990s has not substantively changed from the previous baseline that we discussed with you last spring in the context of the President's FY 1990 budget proposals. The Space Station management team, with the users and our international partners, will continue to further refine the potential program changes. We expect to make the final decisions on the configuration and schedule options within the month.

#### Program Management Reorganization

Concurrent with the configuration review activity NASA has assessed the program's management structure to see how it could be improved. One objective is to better position the organization to complete the transition from definition to design. Another is to improve the efficiency of the program's supporting activities.

With these objectives in mind, NASA has begun to strengthen the Program and Headquarters Offices with the appointment of senior managers with Space Shuttle development experience. We are also looking at redistributing the responsibilities between the Program Office and the Project Offices at the field centers. We are planning to reduce the support activities for the program with respect to the primary development activities.

#### Major Configuration Changes Under Consideration

The program review has resulted in a number of proposed changes to the configuration. Few of the changes include deletions of capability; most involve alterations to systems that are designed to reduce risk, or a rephrasing of capability availability.



Major changes under consideration include the following:

Implementation of a DC power distribution system in lieu of the 20 kilohertz AC distribution system is likely. This change is driven by the cost savings to be realized, and has no effect on station capability. The availability of the second 37.5 kilowatts increment of power is proposed to be delayed by nine months, completed before the international modules are delivered to the station.

A simplification of the two phase thermal control system is under consideration in order to reduce technical and schedule risk, to simplify the assembly process, and potentially to reduce costs.

A delay in some of the habitability support systems by up to two years, to reduce early program costs is being considered. This change would not delay the permanently manned capability milestone.

NASA also proposes to defer indefinitely the new high pressure space suit. Instead, the existing Shuttle space suit will be used for extravehicular activity (EVA). This change would result in substantial development and supporting development cost savings. This would reduce the amount of EVA that can be performed for station activities, consistent with our desire to reduce the EVA requirements significantly.

In order to remove schedule and technical risk from the critical path in the assembly process, the Environmental Control and Life Support System would begin with an open oxygen loop. Oxygen would need to be resupplied during this time, but system closure would be accomplished by Assembly Complete.

We are also investigating phasing user data services to be more in line with user requirements. It is anticipated that these user requirements will grow substantially as the station nears completion of its assembly, and data transmission capability will increase in parallel. The major purpose of this change would be to realize early cost savings.

The integral hydrogen/oxygen propulsion system may be replaced with a modular hydrazine system. The need to reduce technical and schedule risk, assembly complexity, and power consumption is driving this proposal.

Finally, the commonality requirement for the Polar Platform is likely to be removed. Commonality between the polar



platform and the manned base is no longer a desirable requirement since they no longer share common operational support. We are also planning to delay the availability date to of the platform to synchronize it with the availability dates of the proposed Earth Observation System (Eos) payloads.

Even with these changes, the space station at assembly complete will be virtually the same functionally as that envisioned in the program baseline and life cycle cost impacts will be small. Delay of some milestones and capabilities is unavoidable, but the essential station capabilities are maintained and will be available by assembly complete.

### Conclusion

Mr. Chairman, Dr. Lenoir and I would like to close by thanking you and the members of this Committee for the strong support you have given this program since its inception. The last few months have been difficult for us at NASA working on the station, and I know you share our frustration with the necessity of accommodating yet another shortfall. Although I was heartened that the final decision of the Appropriations Committees provided us with a workable funding level, I was disappointed that the full request could not be accommodated. But I was even more disappointed that the multi-year funding we requested for the Space Station Freedom program was not granted. We have requested multi-year appropriations for each of the last two years--without success. I believe that the longer term budget horizon represented by multi-year appropriations is critical to the ultimate success of this program. However, recognizing the reality of the outcome of the appropriations process, we have thoroughly reviewed the program baseline, and I believe we are developing a program plan that can be implemented and that will provide significant user capabilities within a constrained funding availability.

We have worked closely with our users and our international partners to assure that their concerns and interests are accommodated. We have attempted to minimize the impact to the users as we narrowed our options, but some delays in the early capability availability are necessary. We feel that the proposals we are considering do address the schedule concerns of the international partners and the capability concerns of the users within our available resources.

Finally, NASA would like to emphasize the importance of deciding on a program baseline and making the necessary



adjustments to the Space Station Freedom program as quickly and smoothly as possible. Management attention must switch from the review focus to the preliminary design process that has begun and is on a very tight schedule. Timely completion of the preliminary design review activity is fundamental to sustaining meaningful progress on the Space Station Freedom program. Our goal is to move forward with the program so that by next November, we will be one year closer to First Element Launch. We have a busy year ahead of us, and we will certainly continue working with the Committee to make this program a success. We look forward to answering your questions.

